REMARKS

This Amendment and the following remarks are intended to fully respond to the Office Action mailed August 24, 2006. In that Office Action, claims 1-21 were examined. Claims 1-15, 20 and 21 were rejected, and claims 16-19 were objected to. More specifically, claims 1-12 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention; claims 1-12 were rejected under 35 U.S.C. § 101 as being non-statutory claims; claims 1-4, 9, 13-15, 20, and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by Peng (USPN 6,317,754); and claims 16-19 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Reconsideration of these rejections, as they might apply to the original and amended claims in view of these remarks, is respectfully requested.

In this Response, claims 1, 4-13, 16, and 18 have been amended. Claims 2, 3, 17, 20, and 21 have been canceled, and claim 22-27 are newly added. Therefore, claims 1, 4-16, 18, 19 and 22-27 remain present for examination.

Interview Summary

The undersigned thanks Examiner Corey Bell for conducting an in-person interview on December 11, 2006. During the interview, proposed amendments to claim 1 was discussed in relation to the Peng reference. Examiner Bell suggested that identifying a gap in the interval vectors and using the gap in synchronization would be useful in distinguishing the claims over the cited references. No specific agreement was reached on allowance of the claims. Based on the interview with Examiner Bell, the undersigned believes that the foregoing claim amendments place the application in condition for allowance.

Claim Objections – Allowable Subject Matter

Applicant acknowledges with appreciation the indication that claims 16-19 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 13 has been amended to incorporate the limitation of claim 17.

Additionally, claim 16 has been amended to incorporate the limitations of claim 13. Accordingly the Applicant believes that claims 13-16, 18, and 19 are now allowable.

Objections to Drawings and Specification

The Examiner objected to the drawings and specification, because the specification did not describe reference numbers 195 and 405 of the drawings. The specification has been amended to include a description of reference numerals 195 and 405. No new matter has been added with these amendments. Additionally, the description of computer 20 has been amended to correctly refer to computer 110. Based on these amendments, Applicant respectfully requests withdrawal of the objections to the drawings and specification.

Claim Rejections – 35 U.S.C. § 112

Claims 1-12 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for particularly pointing out and distinctly claiming the subject matter which the Applicant regards as his invention. The rejection is based on an extra period erroneously included in the body of claim 1. Claim 1 has been amended to remove the first period on line 6. Applicants request withdrawal of this rejection.

Claim Rejections – 35 U.S.C. § 101

Claims 1-12 were rejected under 35 U.S.C. § 101 as being non-statutory claims. Applicant kindly traverses this rejection.

Specifically, the Office Action states that the term computer-readable medium is defined in the specification to include non-tangible medium, such as a carrier wave. Claim 1 has been amended to replace the term "computer readable medium" with "computer storage medium." As defined in the specification, computer storage media does not include a carrier wave or modulated data signal. Applicant respectfully requests withdrawal of this rejection.

Claim Rejections – 35 U.S.C. § 102(b)

Claims 1-4, 9, 13-15, 20, and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by Peng (USPN 6,317,754) hereinafter "Peng." Applicant respectfully traverses this rejection, because Peng does not teach or suggest the use of an interval vector, which includes a gap in versions between intervals.

In some embodiments of the present invention, interval vectors are used to track changes made to resources that are replicated on two replica members. A resource may be changed/updated periodically on one replica member and as a result have a number of different versions. An interval vector includes intervals of versions of a resource that a replica member has received. Each interval in an interval vector includes an upper bound and a lower bound. For example, a first replica member may have received changes to a resource that resulted in 10 versions of a resource. In this example, the interval vector may include an interval representing all the versions [1, 10], where 1 is the lower bound and 10 the upper bound. In contrast, a second replica member may not have received (e.g., replicated) all the versions of the resource, or may have suffered a failure that caused it to lose information for some of the versions. Accordingly, it may have an interval vector that includes two intervals and a gap between the two, such as [1,5] and [8,10]. When a replication session initiates between the first member and the second member, the interval vectors are compared and the second replica member may request only versions 6 and 7 to be fully synchronized with the first member. The use of interval vectors advantageously allow updates or changes made to resources to be replicated between replica members in a non-sequential fashion. Previous systems simply provided for using a version sequence number that was incremented with each version that a replica member received. A replica member would not receive or store newer versions of resources without first replicating all previous versions in sequence. Thus compared to prior systems, the use of interval vectors provides an efficient way of replicating versions of resources non-sequentially.

The Peng reference describes a system for synchronizing servers that is similar to prior art systems of tracking changes/updates made to objects using merely a sequence number incremented with each change. *See Peng*, col. 2, lines 50-64. Peng teaches the use of version vectors to identify changes/updates made to an object. *See Peng*, col. 3, lines 30-35. The

version vectors do not include intervals of versions, rather they only include a number (e.g., a timestamp) that is increased sequentially with each change/update. *See id.* Peng also describes the use of a summarizing version vector, which summarizes the changes made to objects within an object container. *See id* at col. 10, lines 7-9. As described in Peng, the summarizing vector "in essence contains the identifiers and the timestamps for all of the objects in the respective containers." *Id*, col. 10, lines 7-9. During a synchronization processes, only a summarizing version vector must be exchanged between two object containers. Accordingly, the summarizing version vectors are nothing more than a way of combining, or summarizing, the version vectors of individual objects within an object container. Peng does not teach or suggest the use of interval vectors, which include intervals of versions of a resource, as is claimed in the present application.

The claimed invention recites the use of interval vectors for determining which resources are out of sync between members of a replica set. In this Amendment, claim 1 has been amended to recite an interval vector "comprising at least one gap in versions between two intervals;" "evaluating the first interval vector to identify the gap;" and "using the gap in the first interval vector to determine that a resource is out-of-sync between a first member and a second member of a replica set via the interval vector." The amendment clarifies that the interval vector includes a gap between two intervals of the interval vector, and that the gap is used in synchronizing members of a replica set. This amendment further distinguishes the interval vectors recited in the claims of the present application, from the summarizing vectors and version vectors disclosed by Peng.

The Office Action cites to column 12, lines 42-55 and column 16, lines 46-52 in Peng as teaching the interval vectors as recited in the claims of the present application. The Applicant kindly disagrees with this interpretation of Peng. Column 12, lines 42-55 of Peng describes a process of combining three summarizing version vectors from different object containers to determine a latest common version vector. The latest common version vector is used to purge a log of changes/updates that all of the object containers have replicated. In other words, if all the object containers have received the changes up to 999, then the log of changes up to 999 can be purged. The cited section of Peng describes the process of determining a latest common version vector to use in purging a log of changes/updates. This description does not teach or suggest the

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use of intervals of versions, much less an interval vector "comprising at least one gap in versions between two intervals" as recited in amended claim 1.

Column 16, lines 46-52 of Peng simply describe the summarizing version vector as indicating information about the modifications that have been made to an object container. Peng states that "[t]he i-th component of the summarizing version vector of an object container means that the object container has contained all modifications made by the object container with the identifier Sid_i up until the time indicated by the time stamp t_i." *Peng*, col. 16, lines 46-50. There is no mention in this section of Peng, or any other section, that versions of an object may be described in intervals. Peng, thus, cannot disclose "at least one gap in versions between two intervals."

For at least these reasons, Applicants believe that claim 1 is patentable over the disclosures of Peng. Claims 4-12 depend upon claim 1, and are allowable for at least the same reasons. Newly added claims 22-27 are method claims that include similar limitations to claims 1 and 4-7, and are therefore also allowable for the same reasons.

With respect to the rejection of claims 13-19, claim 13 has been amended to incorporate the limitation of claim 17, which the Office Action noted as including allowable subject matter. Claim 17 has been cancelled. Additionally, the Office Action noted that claim 16 includes allowable subject matter if amended to include all the limitations of claim 13. Claim 16 has been amended to incorporate the limitations of claim 13. Therefore, the Applicant believes that claims 13-16, 18, and 19 are allowable over the references cited by the Examiner.
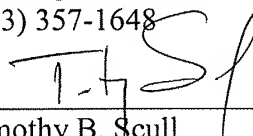
Conclusion

This Amendment fully responds to the Office Action mailed on August 24, 2006. Still, the Office Action may contain arguments and rejections that are not directly addressed by this Amendment because they are rendered moot in light of the preceding arguments in favor of patentability. Hence, failure of this Amendment to directly address an argument raised in the Office Action should not be taken as an indication that the Applicant believes the argument has merit. Additionally, failure to address statements/comments made by the Examiner does not mean that the Applicants acquiesce to such statements or comments. Furthermore, the claims of the present application may include other elements, not discussed in this Amendment, which are not shown, taught, or otherwise suggested by the art of record. Accordingly, the preceding arguments in favor of patentability are advanced without prejudice to other bases of patentability.

A Petition for a one-month extension of time is being submitted herewith. Please charge Deposit Account No. 13-2725 the amount of $120 as the fee for this extension of time. Also, please charge Deposit Account No. 13-2725 the amount of $200 as the fee for one additional independent claim, and the amount of $50 as the fee for one additional claim above the amount previously paid for. It is believed that no additional fees are due with this Amendment. However, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment with respect to this patent application to deposit account number 13-2725.

In light of the above remarks and amendments, it is believed that the application is now in condition for allowance and such action is respectfully requested. Should any additional issues need to be resolved, the Examiner is requested to telephone the undersigned to attempt to resolve those issues.

Respectfully submitted,

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